REMARKS

The Examiner has rejected Claims 1, 4-8, and 11-17, and 24-26 under 35 U.S.C. 102(e) as being anticipated by Airey et al. (6,650,327). Applicant respectfully disagrees with this rejection, especially in view of the amendments made hereinabove.

Specifically, with respect to independent Claims 1, 8, 15-20, and 22-23; applicant has amended each of such independent claims to include at least a portion of the subject matter of pending Claims 22 – 23. Specifically, claimed in each of the independent claims is either:

"wherein the graphics floating point data is packed in the graphics pipeline, the packing facilitating storage of at least two quantities in a single buffer in a single pass" (see this or similar language in Claims 1, 8, 15-20, and 22); OR

"unpacking the graphics floating point data in the graphics pipeline ... wherein the unpacking facilitates storage of at least two quantities in a single buffer in a single pass (see Claim 23).

It is noted that the Examiner has failed to even address the subject matter of pending Claims 22 – 23. Moreover, after careful review of Airey, it is noted that such reference fails to even suggest the foregoing claimed features.

The Examiner is reminded that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. Of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, the identical invention must be shown in as complete detail as contained in the claim.

-9-

Richardson v. Suzuki Motor Co. 868 F.2d 1226, 1236, 9USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim.

This criterion has simply not been met by the Airey reference. As set forth in Amendments A and B, as well as the previously filed appeal brief, applicant respectfully asserts that the prior art simply does not disclose, teach or even suggest the foregoing emphasized claim limitations, especially when taken in combination with the remaining claim elements.

A notice of allowance or a specific prior art showing of the foregoing claim limitations, in combination with the remaining claim elements, is respectfully requested.

Applicant further brings the Examiner's attention to the following subject matter of new Claims 27 and 28 which are deemed to be allowable:

"wherein the packing converts "x" and "y" components of a single operand into a 16-bit floating-point format, packs a bit representation of the "x" and "y" components into a 32-bit value, and replicates the 32-bit value to each of four components of a result vector" (see Claim 27); and

"wherein the packing converts four components of a single operand into a plurality of 8-bit signed quantities, the 8-bit signed quantities being represented in a bit pattern where '0' bits correspond to -128/127 and '1' bits correspond to +127/127, where a bit representation of the converted four components are packed into a 32-bit value, the 32-bit value being replicated to each of four components of a result vector" (see Claim 28).

Again, a notice of allowance or a specific prior art showing of the foregoing claim limitations, in combination with the remaining claim elements, is respectfully requested.

-10-

With respect to independent Claim 24, the Examiner relies on the following
excerpts from Airey to make a prior art showing of applicant's claimed:
"determining whether the graphics pipeline is operating in a programmable mode
utilizing a command associated with a graphics application program interface; if it is
determined that the graphics pipeline is not operating in the programmable mode,
performing standard graphics application program interface operations on the
graphics floating point data; and if it is determined that the graphics pipeline is
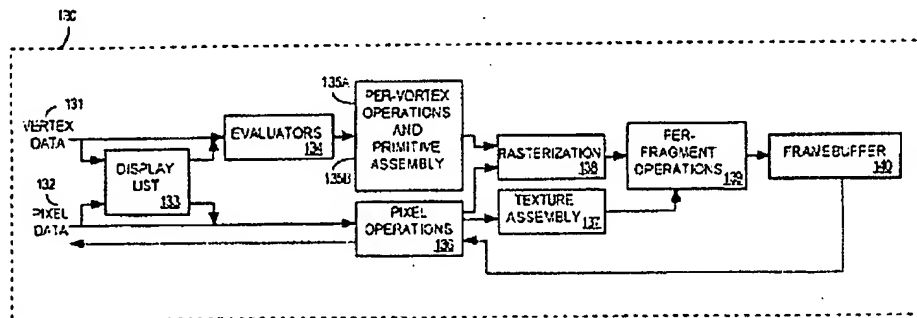operating in the programmable mode..."

FIG. 2

"The graphics program 130, also referred to in the art as a
state machine or a rendering pipeline, provides a software
interface that enables the user to produce interactive three-
dimensional applications on different computer systems and
processors. The graphics program 130 is exemplified by a
system such as OpenGL by Silicon Graphics; however, it is
appreciated that the graphics program 130 is exemplary only,
and that the present invention can operate within a number of
different graphics systems or state machines other than
OpenGL.

With reference still to FIG. 2, graphics program 130 operates
on both vertex (or geometric) data 131 and pixel (or image)
data 132. The process steps within the graphics program 130
consist of the display list 133, evaluators 134, per-vertex
operations and primitive assembly 135, pixel operations 136,

-11-

texture assembly 137, rasterization 138, per-fragment
operations 139, and the frame buffer 140." (col. 6, lines 31-
48).

Such excerpts, however, merely suggest a graphics application program interface (API), such as OpenGL. Neither the graphics API in Airey nor OpenGL, however, suggests any operation of "determining whether the graphics pipeline is operating in a programmable mode utilizing a command associated with a graphics application program interface; if it is determined that the graphics pipeline is not operating in the programmable mode, performing standard graphics application program interface operations on the graphics floating point data; and if it is determined that the graphics pipeline is operating in the programmable mode..." (emphasis added).

Airey thus merely suggests floating-point fragment processing in a fixed-function graphics hardware pipeline. The claimed invention (as embodied in the limitations noted above) uniquely allows floating-point fragment processing to be governed by an application-supplied program (e.g. a shader, etc.) specified through a graphics API with a programmable and non-programmable (i.e. conventional) mode.

Applicant further brings the Examiner's attention to the following subject matter of new Claims 29-32 which are deemed to be allowable:

"wherein, in the programmable mode, the graphics floating point data is operated upon utilizing a predetermined instruction set" (see Claim 29);

"wherein, in the programmable mode, instructions of the predetermined instruction set are executed per a fragment program" (see Claim 30);

"wherein the determining is performed utilizing a command associated with the graphics application program interface" (see Claim 31); and

-12-

"wherein the command is called by a program that governs operation of the graphics pipeline via the graphics application program interface" (see Claim 32).

Again, a notice of allowance or a specific prior art showing of the foregoing claim limitations, in combination with the remaining claim elements, is respectfully requested.

All of the independent claims are now deemed allowable along with any claims depending therefrom. An allowance of all pending claims is respectfully requested.

In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 505-5100. The Commissioner is authorized to charge any additional fees or credit any overpayment to Deposit Account No. 50-1351 (Order No. NVIDP069).

Respectfully submitted,

Kevin J. Zilka
Registration No. 41,429

P.O. Box 721120
San Jose, CA 95172-1120
408-505-5100

-13-